APPENDIX C: Bureau of Alcohol, Tobacco and Firearms Report

DEPARTMENT OF THE TREASURY
BUREAU OF ALCOHOL, TOBACCO AND FIREARMS

OFFICE OF LAW ENFORCEMENT

Statement of Explosives Technology Branch

To: RAC Robert Stewart
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I/N: 745904-98-0009

ETB: W-98-027

Date: January 20, 1998

On January 8, 1998, the Midwest Region Response Team was directed to respond to the Sierra Chemical Plant near Mustang, Nevada. An explosion in their booster plant on January 7, 1998 resulted in the death of four employees and the destruction of the plant.

The booster plant was comprised of two large offset buildings, a break room, a laboratory, and a PETN drying room. The areas of concern are the two large offset buildings, containing booster rooms one and two, and the PETN drying room. Both of these areas were of industrial type construction consisting of a concrete foundation, cinder block walls, and a plywood roof with a composite of fiber insulation and an external rubberized material. These areas were bordered by a rear dirt berm and an approximate 30 degree downslope towards the front, on the south side.

The two large offset buildings comprised, from left to right, booster room one, a storage area, locker room, booster room two, flux room, and tool room. This combination of buildings sat at the top of a hill at the base of a mountain.

Located approximately 50 yards downhill from booster room one was the PETN drying room. This building was comprised of three areas. The first room was empty and allowed workers to shield themselves from the weather while they downloaded PETN. The second room contained a centrifuge and an area where the PETN would be hanged to drip dry. The third and final room contained racks where the PETN was laid down to complete the drying process. This structure was located north, on an uphill grade approximately 100 yards from the entrance of the plant.

Primary areas of interest were booster room two, and the PETN drying room. Booster room two included six mixing kettles aligned in a U shape toward the rear wall, two circular pouring tables centered in front of the kettles, and a cooling bin toward the left front wall. The mixing kettles were numbered one through six from right to left. Mixers 1, 2, 5, and 6 were large kettles, and could contain approximately 100 pounds of Composition B explosives. Mixers 3 and 4 were small kettles, and could contain approximately 80 pounds of Pentalite explosives. Mixers 1 and 6 were never used. Booster room two used steam to mix the explosives verses heated water used in room one, and all mixers were hydraulically controlled. In addition, booster room two was new and had only been operational for a couple of months.

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Reportedly, a crystaline coating adhered to the ceiling of booster room one. Interviews revealed the origin of the crystals. The crystals resulted from emitting vapors in the mixing process. These supposed explosive vapors would rise to the ceiling and resolidify in the form of crystals.

A question was also raised as to whether or not the mixing kettle motors in booster room two were in fact explosion proof. These types of motors prevent the introduction of inadvertent sparks from electrical current into the mixing kettles. At the time of this report, this could not be verified.

On the morning of the accident, approximately 3,000 pounds of explosives were contained in booster room two. Conversely, the PETN drying room, as outlined above, contained approximately 11,000 pounds of wet PETN that morning. And according to an employee, the centrifuge was turned off and no one had yet gained entrance to the drying room prior to the explosion.

On this day, two people were assigned to work in booster room two. One was late for work and the other was seen in booster room one at approximately 7:30 a.m. At that time, booster room one, according to interviews, had been operational for a couple of hours and contained more explosives than booster room two, but no specifics could be given. All that could be ascertained was that each booster room could contain approximately 5000 pounds of explosives.

After being seen in booster room one, the employee scheduled to work in booster room two had to proceed to the employee locker room. According to interviews, it was customary for an employee to take up to 10 minutes to change clothes in the locker room prior to beginning their shift. This puts the employee entering booster room two at approximately 7:40 a.m. (the blast occurred at 7:54 a.m., leaving about 14 minutes of operational time for the employee). Using 7:40 a.m. as the time of entry, the employee would enter booster room two, ensure that the appropriate amount of explosives were present to start the mixing process , inspect the mixing kettles (through interviews, it was determined that the kettles were not always cleaned but procedure is to leave the pots empty), and start the mixing process in the large, Composition B pot, which could take up to an hour. Since one employee was late, the only kettle that should have been started the morning of the accident was kettle number 5. Procedure states that this kettle would be started, and at the latest possible moment, the smaller, Pentalite kettle would be started. The pouring process would then begin with an 80/20 Composition B and Pentalite mixture, respectively.

Post blast investigation revealed that structural and kettle fragmentation had been thrown to the northeast and northwest side of the mountain, which buttressed the structure containing both booster rooms. Lighter fragmentation had been propelled eastward into an adjoining canyon. Small pieces of what should be mixing kettle 5, to include the drive shaft, were found on the hill to the east and more, small kettle pieces were found to the west. These pieces of fragmentation displayed detonation effects. The fact that these

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pieces were found at far distances established not only a blast pattern, but also the presence of immense force. These factors indicate that high explosives were present in what procedure states should be mixing kettle 5.

Further investigation of the PETN drying room blast crater indicated the absence of fragmentation from booster room two in or around the area. Additionally, a blast pattern was outlined on the grass on the east hill with dust that can be followed directly back to the PETN drying room crater. This blast pattern is indicated by the grass on the hill being blown down in a northeast direction. In addition, fragmentation from the trailers that were staged next to the tool room, hence booster room two, was found on the east hill covered with dust from the PETN drying room crater. Also, the right wall of booster room one was sandwiched between the concrete floor and its front wall. Finally, a seismographic report states that the second detonation was of greater magnitude than the first.

All of these indicators state that booster room two detonated first, followed by the PETN drying room. If the PETN drying room had exploded first, fragmentation from booster room two would have been present in and around the PETN crater. Scene processing indicates that this is not the case. The detonation of booster room two created fragmentation that dispersed and hit the PETN drying room, causing the PETN drying room to detonate. This secondary detonation created a detonation wave and fragmentation that formed a blast pattern originating from the PETN drying room.

The grass on the east hill was blown down in a northeast direction, displaying a blast pattern, and again indicating that the PETN drying room detonated second. If the PETN drying room had detonated first, the grass would have blown the grass in a northeasterly direction, and then the blast from booster room two would have blown the grass in a easterly direction. This is not the case.

Trailer fragmentation on the east hill is covered with dust from the PETN crater, which outlines the blast pattern mentioned above. This indicates that booster room two detonated and threw trailer fragmentation to the east. Then the PETN drying room detonated and covered the trailer fragmentation with its dust. Had the opposite occurred, the trailer fragmentation would not have been covered by dust from the PETN crater, it would have been laying on top of it and the blast pattern would, again, lead back to booster room two.

When looking up the hill, the right wall of booster room one was blown down, followed by its front wall, which landed on top of it. This indicates that booster room two exploded, and its pressure wave knocked down the right wall of booster room one. Then the PETN drying room exploded and its pressure wave knocked down the front wall of booster room one.

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Finally, a seismographic report states that the second blast was greater than the first blast. This correlates to the fact that there were more explosives in the PETN drying room than in booster room two. Hence, booster room two detonated, followed by the PETN drying room.

In conclusion, it is the opinion of the undersigned that booster room two detonated and then the PETN drying room detonated. Exactly what caused the booster room to explode is unknown. However, there is no evidence of any criminal act and, thus, the explosion was accidental.

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